Boulder Creek Restoration Project

Fisheries Resource Report

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for:

Bonners Ferry Ranger District
Idaho Panhandle National Forests

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Introduction

This report has been included as part of the required analysis for the Boulder Creek Restoration Project (BCRP) on the Bonners Ferry Ranger District. The focus of this report is to document existing conditions for the fish species and associated aquatic habitat in the project area and to analyze potential project effects to this resource. A complete and detailed description of the project area, purpose and need, and proposed project alternatives can be found in the Boulder Creek Restoration Project Environmental Assessment (EA).

Only a subset of proposed project activities and opportunities will be fully analyzed in this report as these have been determined to be of greatest concern for potential effects to the fisheries resource. The following list identifies which project components will be analyzed in greater detail and which project components will not be analyzed followed by an explanation for this reasoning.

Project Components and Opportunities to be Fully Analyzed for effects to Fisheries Resource:

- *Commercial harvest and yarding in riparian habitat conservation areas (RHCA) of Unit 42* - This analysis will be important because management activities in RHCA's have a greater chance to affect aquatic habitat and organisms. The location where this project activity would occur increases the potential to affect water temperatures, reduce recruitment of instream large wood, increase sediment levels in streams, and alter riparian zone function.

- *Removal or replacement of culverts associated with storing roads and improving aquatic organism passage (AOP) in RHCA's* – This component will be important to analyze because it can lead to a short-term increase in sediment levels in a stream during construction and would be critical to habitat connectivity by reconnecting native fish populations to fragmented habitat.

- *Controlling and managing spread of invasive plants* – The introduction of some herbicides in an aquatic environment can be detrimental to aquatic organisms. In the BCRP, we would like to use an herbicide that is not approved in the Bonners Ferry Weeds Management EIS (1995) but is known to be less impactful to aquatic environments and the Forest has begun a transition to using this compound more frequently. The proposal to use an alternate herbicide closer to streams in the project area can affect riparian zone function and degrade water quality.

Project Components and Opportunities Not Analyzed in Detail:

- *Commercial harvest outside RHCA's* – Vegetation treatments associated with this project would be required to use Best Management Practices (BMP) and design features developed to protect soil and water resources. Research and monitoring results verify that when appropriate riparian habitat conservation area buffers are applied to stream corridors in project areas and best management practices are correctly applied, sediment delivery to the stream channel as a direct result of vegetation treatment is not measurable or is negligible (Reid and Hilton 1998; Belt et al. 1992; USDA Forest Service 2000). Further, hydrologic analysis from the BCRP Hydrology Report (Project File) modeled the potential for sediment from the harvest areas and it suggests no measureable sediment generated from harvest activities outside RHCA's would be delivered to streams in the

project area. As a result, it has been determined potential impacts to aquatic habitat and organisms as a result of timber harvest would not have measurable impacts to the fisheries resource.

- *Road reconstruction, maintenance, storage, and temporary road construction* – Road associated activities proposed for alternatives 2 and 3 certainly have the potential to initially generate sediment that may reach streams in the project area. However, employing the use of BMP's and project design features would greatly reduce the quantity and duration of sediment generated (Seyedbagheri 1996; Keller and Ketcheson 2015). Further, drainage ditch and culvert clearing, as well as road surface improvements, can significantly reduce the risk of erosion and road failures at stream and drainage crossings by removing debris that can back-up water causing it to flow over the road surface (Burroughs and King 1989; Sugden and Woods 2007). After completion of these activities, FSWEPP modelling efforts indicated both alternatives would actually reduce average annual sediment delivery by 3.3 tons/year over existing conditions (BCRP Hydrology report). As a result, the short term impacts to aquatic habitat as a result of road-related activities would be far outweighed by the long term benefits of reducing chronic sediment to project area streams and are not expected to jeopardize the existence of fish species and beneficial aquatic habitat in the project area.

- *Fuel Reduction Activities* - The prescribed burning associated with this project under alternatives 2 and 3 would be subject to BMP's, design criteria, and ignition would not occur in RHCA buffers. Additionally, all burning activities would be closely managed and monitored to prevent unintentional consequences. As a result, some fire may creep into the outer edges of some RHCA's but the RHCA's would remain intact and functioning properly. This would benefit fish populations and aquatic habitat because properly functioning RHCA's protect streams and water temperatures from solar radiation, provide effective filtration from upland sediment sources, and maintain stream complexity by continuing to provide a source of large wood recruitment into the streams.

- *Producing Forage for Wildlife* – This would be achieved through vegetation treatment, underburning, and prescribed fire. These components have already been discussed directly above and have been determined to be insignificant to the fisheries resource.

- *Improving Trail Parking Facilities* – This component of the BCRP would primarily focus on improving parking conditions for vehicles with stock trailers. All improvements would occur at existing trailhead parking areas except for one. The current trailhead parking area for Trail #136 would be moved about 1.5 miles further up FSR #314. This would allow the old parking area, which sits very close to Boulder Creek, and about ½ mile of the existing trail to be closed. This section of trail has been washing away as Boulder Creek shifts. This would eventually reduce sediment into Boulder Creek and benefit aquatic habitat and organisms.

- *Reintroduction of Beaver to Boulder Meadows* – The Boulder Creek drainage was historically influenced with the help of beavers and both research and literature strongly supports the idea that the wetland complexes created by beavers likely provide beneficial summer and winter rearing habitat for native fish species, increased water storage for longer seasonal downstream delivery, increased nutrient availability in the stream, and decreased water velocities and sediment delivery to downstream reaches. As a result, implementation of this project opportunity would not have a substantial negative impact on the fisheries resource in the Boulder Creek drainage.

Regulatory Framework

The regulatory framework providing direction for the management of the fisheries resource and aquatic habitat on the Idaho Panhandle National Forests and relevant to this analysis includes the following:

Land Management Plan for the Idaho Panhandle National Forests

The 2015 Idaho Panhandle National Forest Land and Resource Management Plan (the Forest Plan) provides standards and guidelines for aquatic habitat and aquatic species and all projects and activities authorized by the Forest Service must be consistent with the applicable plan components. Plan components that may be applicable to aquatic habitat and aquatic species are found on pages 26-29 of the plan and project consistency with all applicable Goals, Objectives, Desired Conditions, Standards, and Guidelines from the Forest Plan have been addressed (more information is available in the project record).

Federal Law

Federal law providing direction for the management of the fisheries resource and aquatic habitat on the Idaho Panhandle National Forests and relevant to this analysis includes the following.

Endangered Species Act (ESA)

Section 7 of the ESA requires Federal agencies to consult with the U.S. Fish and Wildlife Service to insure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat.

National Forest Management Act (NFMA)

NFMA requires that projects "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives" in the Plan area (16 USC §1604 NFMA § (g) (3) (B)). The “Plan Area” in this respect applies to the Forest Plan for the Idaho Panhandle National Forests. Section 6 of NFMA also requires that all projects and activities authorized by the Forest Service must be consistent with applicable Forest Plan components Sec. 6(i) and (36 CFR 219).

Inland Native Fish Strategy (INFS)

INFS (USDA Forest Service 1995) guidance has been incorporated into the Forest Plan and is therefore addressed under Forest Plan consistency (above).

Executive Orders

Invasive Species, EO 13112 of February 3, 1999

Federal Agency Duties. (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm would be taken in conjunction with the actions.

Recreational Fishing Opportunities, EO 12962 of September 26, 2008.

Federal Agency Duties. Federal agencies shall, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by one or more methods identified under this executive order.

State and Local Law

Idaho Stream Channel Protection Act

The Idaho Stream Channel Protection Act requires that the stream channels of the state and their environment be protected against alteration for the protection of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty and water quality. The Stream Channel Protection Act requires a stream channel alteration permit from Idaho Department of Water Resources before any work that would alter the stream channel, such as a culvert replacement, may begin. Although this project is located in the State of Washington, this act is relevant to the downstream impacts and cumulative effects associated with the action alternatives. The State of Washington does not have a similar Act.

Idaho Forest Practices Act

The Idaho Forest Practices Act regulates forest management on all ownerships in Idaho, including National Forest System lands (IDAPA 20.02.01). The Forest Service has an agreement with the State of Idaho to use best management practices for all management activities that will meet or exceed guidelines described in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22). Following these best management practices will help achieve the water quality protection elements of the Idaho Forest Practices Act.

Topics and Issues Addressed in this Analysis

Purpose and Need

The aquatics component of this project is a relatively small part of the purpose and need for the BCRP. Whereas the condition of the fisheries resource in the project area is not degraded enough to be one of the primary drivers, opportunities for improvements do exist and would be addressed with either action alternative.

Issues

Several aquatics-related issues were identified during field reviews and data collection efforts prior to this analysis. They include:

- The need to reduce the risk of sediment from entering project area streams from sources such as roads, trails and recreation sites.
- The need to address several culverts considered impediments, or complete barriers, for fish to access beneficial upstream habitat.

Resource Indicators and Measures

The fisheries resource in the BCRP area includes fish populations and their associated aquatic habitat. Table 1 displays the two principal *Resource Elements* of the fisheries resource, the three *Project Activities* of greatest concern to the fisheries resource (see page 1 and 2 for explanation),

and the *Habitat Indicators* used to facilitate the effects discussion. These resource indicators represent important components of beneficial cold water habitat for fish and other aquatic organisms. In addition to aquatic habitat, this analysis will focus on just westslope cutthroat trout, a listed sensitive species, because no other threatened, endangered, or sensitive species exist in the project area. This does not preclude the potential for other cold-water fish species (i.e. rainbow trout and brook trout) to be present in the watershed. However, if present, effects and impacts to those species would likely be similar to that of westslope cutthroat trout. As mentioned previously, only a subset of the proposed project activities and opportunities, those which pose the greatest risk for impacts to the fisheries resource (Table 1), will be analyzed in greater detail in the "Environmental Consequences" section of this document.

Table 1. Principal elements and relevant indicators for the fisheries resource.

Resource Element	Project Activity	Habitat Indicators
Aquatic habitat Westslope cutthroat trout.	Commercial harvest in riparian habitat conservation areas Culvert removal and replacement Controlling the spread of invasive plants	• Changes to water temperatures • Changes to instream large wood • Changes to sediment levels in streams • Changes to riparian zone function • Changes to habitat connectivity • Changes to water quality

Bull trout, a threatened species, have been documented in Boulder Creek downstream of the falls, but this is well downstream of the area of influence presented by this project. As a result, bull trout will not be the focus of this discussion.

Methodology

The objective of this analysis is to disclose the potential impacts or benefits of the various project alternatives on the fisheries resource in the project area. Fisheries resources will include any threatened and endangered species, sensitive species, and management indicator species that are thought to be present, and the aquatic habitat that supports them. Each alternative is analyzed based on the potential to change issue indicators (Table 1) from their existing condition. To achieve this, existing fish population and aquatic habitat conditions in the project area are described to establish a reference condition which will provide the basis to which proposed project activities can be evaluated. Once the reference condition has been established, potential direct and indirect effects associated with the project, as well as cumulative effects associated with past, present, and reasonably foreseeable activities throughout the analysis area, are analyzed to disclose the potential effects on the fisheries resource.

Information Sources

Data and documents used to support this analysis include:

- Project proposal and associated alternatives
- Bonners Ferry District files and databases
- Boulder Creek Restoration Project hydrologic analysis report
- PacFish InFish Biological Opinion (PIBO) Monitoring Program data
- Published and unpublished literature

- Aerial photographs
- Geographic information systems (GIS) files
- Fish distribution surveys
- General stream and habitat surveys
- Road and culvert surveys
- Historical records.

There always remains some level of uncertainty with any analysis that attempts to predict the effects of management activities on the natural environment. Ecological components, including habitat and the species it supports, can have highly complex relationships that continue to evolve and are not always consistent from one area to the next. These inconsistencies make it difficult to understand and disclose all potential interactions. To help alleviate some of this uncertainty, this analysis will use the most applicable scientific literature and the best available data for this area.

Spatial and Temporal Context for Effects Analysis

Direct, Indirect, and Cumulative Effects Boundaries

The spatial boundary for analyzing the direct, indirect, and cumulative effects to the fisheries resource is the two sub-watersheds that form the project area – Upper Boulder Creek and Lower Boulder Creek (Figure 1). This scale is considered appropriate because it includes accessible habitat capable of supporting westslope cutthroat trout populations and there is hydrologic connectivity between these two sub-watersheds.

The temporal boundaries for analyzing the direct, indirect, and cumulative effects will be considered short-term, those occurring within five years of the BCRP, and long-term, those lasting greater than five years.

Affected Environment

Analysis Area

The analysis for this report focuses on the geographic area that could be affected by the proposed actions of this project. For the fisheries resource, that area will be defined as the Boulder Creek watershed, which includes Boulder Creek and all of its tributaries. Some of the larger named tributaries include Pinochle Creek, Cabin Creek, Black Creek, Clifty Creek, Middle Fork Boulder Creek, McGinty Creek, East Fork Boulder Creek, Gable Creek, and North Creek.

Existing Condition

Fish Species Distribution and Status

Literature reviews, agency databases, electrofishing surveys, and personal contacts were used to help determine the potential fish species composition and distribution in the project area.

The primary and most significant fish bearing streams in the BCRP area include Boulder Creek, Middle Fork Boulder Creek, and East Fork Boulder Creek. However, most of the smaller tributaries that flow into these larger streams also support fish populations. Fish distribution records for the Idaho Panhandle National Forests and recent electrofishing surveys conducted in 2013 and 2014 indicate species diversity in the Boulder Creek watershed is comprised of primarily westslope cutthroat trout, rainbow trout, and brook trout. In general, rainbow trout

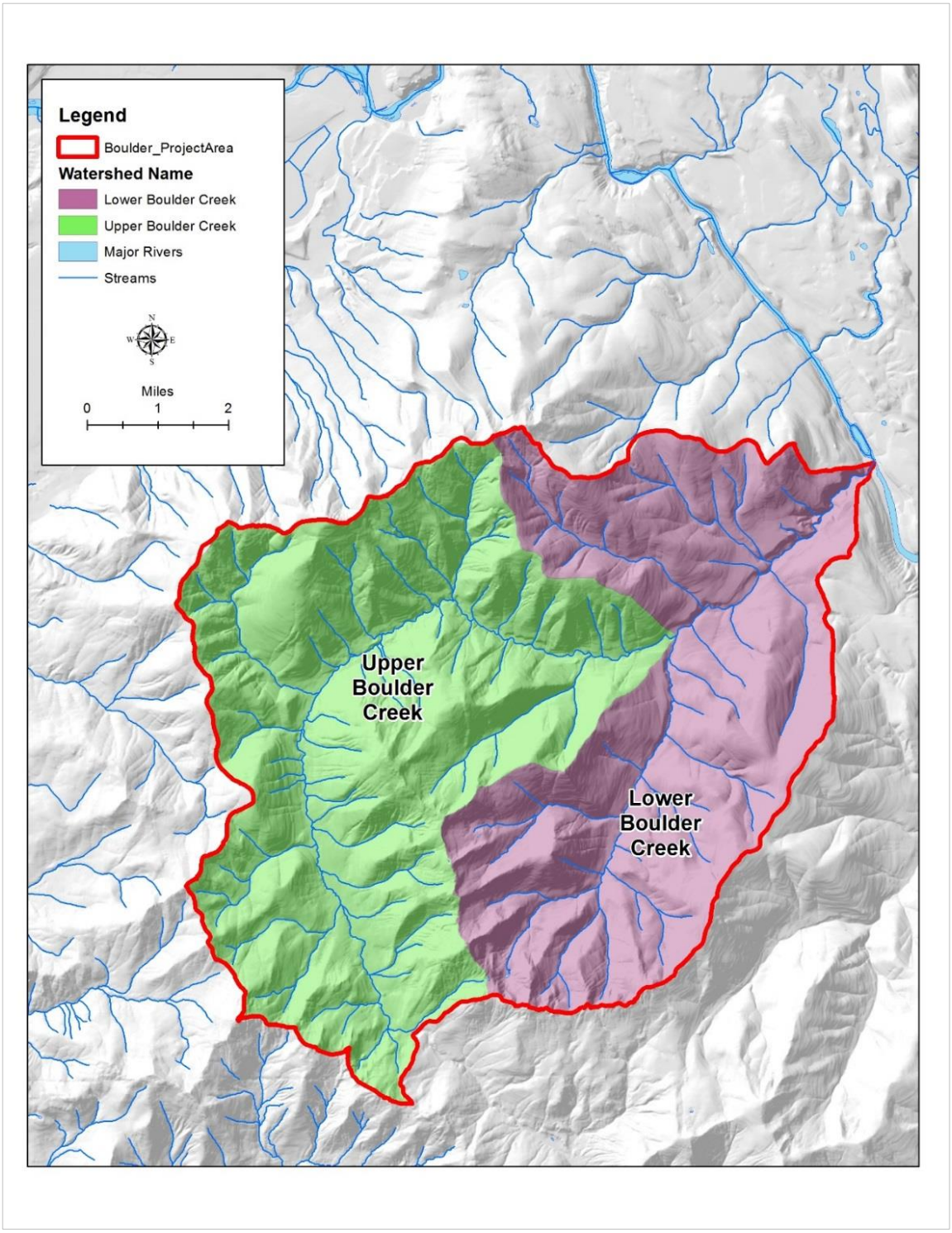

Figure 1. Map of primary watersheds used to delineate the Direct, Indirect, and Cumulative Effects area for the Boulder Creek Restoration Project analysis**.**

were the most prevalent species collected in the lower reaches of Boulder Creek and throughout East Fork Boulder Creek. Westslope cutthroat trout and brook trout were about equally represented in upper Boulder Creek and many of its tributaries in the area of Boulder Meadows. Other fish species may be present in these streams but were not found during electrofishing surveys and have not been documented in the literature and databases used for this report.

The Idaho Department of Fish and Game historical fish stocking database was searched for past fish stocking activities in streams of the BCRP area to try and explain the occurrence of non-native brook trout and rainbow trout. Those records, which date back to the late 1960's, indicate that these streams have never been officially stocked with any species of fish. However, the presence of brook trout and rainbow trout indicates these species must have been stocked in the Boulder Creek watershed at some point. This concept is further supported by the existence of a set of falls in lower Boulder Creek, about 1.2 miles upstream of the confluence with the Kootenai River, which is a complete barrier to upstream fish passage. Brook trout and rainbow trout from the Kootenai River would not have been able to access the watershed upstream of the falls.

A likely explanation for the occurrence of these two species above the falls is they may have been stocked in Boulder Creek by Idaho Fish and Game prior to the late 1960's. Even though the historical stocking database dates back to the late 1960's, these records do not give the complete history of fish stocking by Idaho Fish and Game. As a result, any fish stocking prior to the late 1960's would not be represented in this database.

It is also possible that the rainbow trout found in our collecting efforts were actually interior redband trout, a subspecies of rainbow trout native to a limited number of streams in this area of Idaho. However, in 2006, the Idaho Department of Fish and Game genetically screened 187 *Oncorhynchus sp.* (cutthroat trout and rainbow trout) samples from fish collected in the Boulder Creek watershed in an effort to assess the rate of hybridization between rainbow trout and cutthroat trout (Campbell and Kozfkay 2008). They were also interested in determining whether the rainbow trout found in the drainage were related closer to interior redband trout or rainbow trout of coastal origin. Rainbow trout used in most hatchery programs are of coastal (west coast of the United States) descent and were commonly stocked all over the United States.

Results of their research indicated that fish collected in the middle reaches of Boulder Creek exhibited high levels of hybridization between cutthroat trout and rainbow trout (66.1% of the fish collected). Levels of hybridization in lower Boulder Creek and upper Boulder Creek were 11.4% and 14.8%, respectively. Further, they determined that the rainbow trout collected for their study showed evidence of extensive coastal rainbow trout introgression – meaning the rainbow trout found in the Boulder Creek drainage are more similar to hatchery rainbow trout than to native redband trout. This presents even further evidence that the rainbow trout population in the drainage, while currently persisting and reproducing naturally, are likely the descendants of non-native hatchery fish that were stocked in the drainage prior to the late 1960's.

Endangered, Threatened, and Sensitive Species

Guidance provided in the Forest Service Manual directs the Forest Service to identify and prescribe measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species (FSM 2670.31 [6]). Additionally, the Manual directs the Forest Service to manage the habitat of species listed on the Northern Region Sensitive Species List to prevent further decline in their populations, which could lead to Federal listings under the Endangered Species Act. No

endangered or threatened species exist in the project area and westslope cutthroat trout is the only sensitive species to occur in the project area. As a result, this analysis will only focus on potential effects to westslope cutthroat trout.

Management Indicator Species – Focal Species

Management Indicator Species (MIS) were identified in the Forest Plan Revision process and were proposed because they represented an issue or concern. On June 23, 2016, the IPNF administratively changed the monitoring under the Plan to comply with the 2012 Planning Rule. At that time, MIS were removed and aquatic macroinvertebrate assemblages were added as Focal Species to monitor the desired conditions for aquatic habitat and the ecological health of waterbodies and streams on the Forest. The PACFISH/INFISH Biological Opinion (PIBO) Implementation and Effectiveness Monitoring Team will use the River Invertebrate Prediction and Classification System score as the indicator for the Forest. This monitoring will occur every 5 years and will not occur at the project level.

Aquatic Habitat

Over 122 miles of streams exist in the project area. Of this, approximately 33.5 miles are considered important spawning and/or rearing habitat for resident fish populations. A summary of several of the larger streams and their fisheries attributes and condition will follow.

- **Boulder Creek –** Being the primary stream in the project area, all other tributaries flow into Boulder Creek before it flows into the Kootenai River. A set of falls impassible to upstream fish passage exists on Boulder Creek about 1.2 miles upstream from the confluence with the Kootenai River in the "canyon" section. This is the only barrier to fish migration known to occur in Boulder Creek. Rainbow trout dominated our fish collection efforts in this lower section but smaller numbers of westslope cutthroat trout were also collected.

  Moving upstream from the falls, lower Boulder Creek transitions from a steeper gradient stream consisting of deep pools and boulder-created pocket water to the middle sections where the stream flattens but flows still have the potential to carry much energy. Here in the middle section, aquatic habitat is more diverse and complex than downstream. While having fewer deep pools, more riffles and smooth-water glides exist and the number of boulders and large wood in this section still provide plenty of complexity and beneficial aquatic habitat. Pockets of appropriately-sized spawning substrate can be found where flows are slower and where gravels have been "sorted" by hydrologic processes.

  Finally, continuing to move upstream, the upper portion of the creek flattens considerably in the area of Boulder Meadows. Here, ample large wood in the stream creates relatively deeper pools and provides beneficial instream cover. Spawning substrate is more plentiful here as flows are generally mild enough that these gravels remain. However, this high in the watershed can leave Boulder Creek running dry, or subsurface, during the drier and hotter months later in the summer. Westslope cutthroat trout and brook trout were the only species collected in this upper reach and its tributaries.
- **Middle Fork Boulder Creek –** This tributary of Boulder Creek provides approximately 2 – 2.5 miles of steeper steppool-type aquatic habitat for fish species adapted to persist in these conditions. The stream gradient here is probably too steep for non-native brook trout to successfully persist leaving this stream to westslope cutthroat trout, rainbow trout, and hybrids between the two species. Small pockets of sorted gravels behind boulders and larger pieces of wood probably provide a limited amount of beneficial spawning habitat. Water temperatures likely remain cool throughout the summer but winter conditions may force

resident fish to move downstream into Boulder Creek until ice has melted and water temperatures begin to rise again. Small numbers of westslope cutthroat trout and rainbow trout were collected in this stream.

The culvert that passes Middle Fork Boulder Creek under Forest Road #628 is thought to impede upstream fish passage. Up until December 2015, this pipe was probably effective passing fish upstream. However, the rain-on-snow event on December 9, 2015 likely increased flows enough in this tributary that over half the natural boulder and cobble substrate material in the bottom of the pipe washed out leaving a smooth pipe surface with nothing to break up the flows. As a result, water velocities through the pipe are likely often too fast to allow upstream fish passage except for maybe the larger and stronger swimming fish.

- **East Fork Boulder Creek –** This stream is the largest tributary to Boulder Creek and likely provides the greatest amount of beneficial aquatic habitat. The lower section of this stream is characterized by a cobble and gravel dominated substrate but plenty of larger boulders and downed large wood provide additional complexity and help the formation of deeper pools. In between the pools are plenty of riffles and glides. Accounts of a natural barrier to upstream fish passage in this lower section exist (Paragamian 2008) but was not confirmed in our surveys. Rainbow trout and brook trout were the only species collected here.

  Further upstream, above the Forest Road #628 bridge, East Fork Boulder is a smaller replica of its lower reaches. Larger boulders and cobble dominate the substrate and large wood is still very abundant. Again, only rainbow trout and brook trout were collected.

- **Other fish-bearing tributaries** – As mentioned previously, many of the smaller tributaries to Boulder Creek and East Fork Boulder Creek are providing beneficial aquatic habitat and contributing to the persistence of fish populations in the project area. However, many of these streams in the lower watershed are very steep and fish only have limited access before the gradient prevents further upstream movement. Likely one of the most important benefits to the fisheries resource provided by these smaller tributaries is a source of cold water throughout the summer months when Boulder Creek starts to warm.

Environmental Consequences

The following section of this report provides information and discussion regarding the potential direct, indirect, and cumulative effects of the various alternatives and opportunities to the fisheries resource in the project area. Detailed descriptions of each alternative can be found in the Boulder Creek Restoration Project Environmental Assessment.

As mentioned previously, only a subset of the proposed activities and project opportunities will be addressed in greater detail. It is these activities that pose the greatest risk for impacts to the fisheries resource. Further, the following discussion will describe the potential for change, from existing conditions, for each of the aquatic habitat indicators (Table 1) based on select activities associated with each alternative and how this could affect westslope cutthroat trout populations in the project area.

Effects of Alternative 1 (No Action)

Summary:

Under this alternative, certain management activities would likely not occur in the short-term in the Boulder Creek watershed (stand improvement/timber harvest, prescribed burning/fuels reduction, road decommissioning/storing, recreational site improvements, wildlife habitat improvements) while other management activities would still likely occur (fish passage improvements, minor road maintenance, and control of roadside invasive plant species), but maybe not to the degree proposed in the action alternatives. The condition of aquatic habitat and health of westslope cutthroat trout populations in the watershed would likely follow existing trends and remain relatively unchanged while relying on natural processes to maintain or restore some impacts associated with past management activities. Deteriorating road conditions and associated chronic sedimentation would likely increase without the needed level of road maintenance and this would likely present a moderate risk of altering beneficial aquatic habitat.

Direct, Indirect, and Cumulative Effects

Under the no action alternative, the extent of activities proposed in alternative 2 and alternative 3 would not occur (as described in the EA). As a result, there would be no direct, indirect, or cumulative effects associated with this alternative. In general, if no project components are initiated and completed under the Boulder Creek Restoration Project, existing trends and conditions for this area would likely prevail. However, selecting alternative 1 would not preclude accomplishing other management activities that have already been approved, or will be approved in the future, in the project area.

Condition of Issue Indicators based on Existing Trends

The following discussion will identify the potential for change of existing conditions for several *Aquatic Habitat Indicators* (Table 1) based on selecting the no action alternative and how this could affect westslope cutthroat trout populations in the project area. Keep in mind, the occurrence of some natural events and activities can be hard to predict (wildfire, 100-year floods, blow-downs, etc.) while others can be fairly certain (road use, trail use, rain on snow, high-water events, weed suppression, barrier culverts, etc.).

Changes of sediment levels in streams – Because the chances for hillslope erosion, debris slides, streambank failures, road use, and road failures are all expected to continue to occur in the project area, sediment will continue to be delivered into area streams. Whereas some sediment delivery to streams is a natural process and beneficial to aquatic ecosystems, forest roads and associated sedimentation are considered some of the most critical components affecting the aquatic environment (Gresswell 1999, Trombulak and Frissell 2000, Gucinski et al. 2001, Grace and Clinton 2007), even more so than fires and logging (Rieman and Clayton 1997). Poor road location, lack of sufficient road maintenance, and increased use above original design specifications can lead to increased sediment delivery to waterbodies (Grace and Clinton 2007, Luce et al. 2001) and increase the potential for detrimental impacts to aquatic organisms and habitat.

Based on current and predicted future funding allocated for road maintenance on the IPNF, the condition of forest roads in the project area will continue to decline. As a result, chronic

sedimentation and periodic road failures will continue to increase sediment levels into streams above natural levels and be a concern for the fisheries resource in the Boulder Creek watershed.

Changes to water temperatures – Solar radiation plays a large role on influencing stream temperatures (Brown 1969; Johnson and Jones 2000; Johnson 2004; Caissie 2006) and maintaining adequate overhead canopy cover along streams is likely the most effective variable to reduce that radiant heat source (Gravelle and Link 2007; Krauskopf et al. 2010). Under the no action alternative, existing riparian areas and associated riparian canopy cover over streams are expected to be maintained and continue to provide effective shading. As a result, substantial changes to water temperatures are not expected to occur in the Boulder Creek watershed.

Changes to instream large wood - Large wood in streams improves complexity of beneficial aquatic habitat and is largely a product of an intact and properly functioning riparian area. Under the no action alternative, existing riparian areas in the Boulder Creek watershed are expected to be maintained and continue to function naturally. As a result, a measurable decrease in the quality or quantity of large wood in project area streams is not expected to occur.

Changes to habitat connectivity – Both natural and man-made fish passage barriers exist in the project area. All natural barriers are serving a purpose and will be left in place. The culverts that pass Middle Fork Boulder Creek under Forest Road #628, Cabin Creek under Forest Road #427, and Black Creek under Forest Road #427 all likely impede upstream fish passage to beneficial aquatic habitat. Because the culvert passing Middle Fork Boulder under Forest Road #628 is an aquatics program priority, there remains a very good chance that the culvert would still be replaced even if the no action alternative is selected. The other two culverts are considered project opportunities and are of lower priority. It is reasonable to predict the chances for their replacement isn't necessarily reduced or improved with the selection of any of the three alternatives. As a result, some habitat connectivity will likely be restored (Middle Fork Boulder Creek) regardless of which alternative is selected but it remains unknown how soon fish passage issues on Cabin Creek and Black Creek would be resolved.

Changes to riparian zone function – Under the no action alternative, existing riparian areas in the Boulder Creek watershed are expected to be maintained and continue to function naturally. As a result, a measurable decrease in the quality or function of riparian zones in the project area is not expected to occur.

Determination of Effects on Aquatic Habitat from Alternative 1

Selecting alternative 1 would not be expected to have substantial impacts to the existing condition of aquatic habitat in the Boulder Creek watershed. However, the lack of appropriate levels of road maintenance in the drainage means chronic sediment delivery to area streams will continue and likely present the greatest potential risk to altering existing aquatic habitat conditions. Also, fragmentation of beneficial stream habitat will likely persist at one or two of the three identified culvert fish passage barriers.

Determination of Effects on Westslope Cutthroat Trout from Alternative 1

Alternative 1 may have an indirect impact on westslope cutthroat trout in the Boulder Creek drainage due to chronic sedimentations from existing roads, but would not likely lead to a trend that would warrant federal listing for the population. Fish habitat and fish populations would remain semi-fragmented due to several culverts impeding upstream fish passage.

Effects of Alternative 2 (Proposed Action) and Alternative 3

Summary:

When considering the influences from direct and indirect effects of all action alternatives, in conjunction with effects of project opportunities and cumulative effects from past, ongoing, and reasonably foreseeable activities, neither alternative 2 or 3 is expected to substantially change the trend for existing aquatic habitat and fish populations in the Boulder Creek Restoration Project area or cumulative effects area. The replacement of the culvert passing Middle Fork Boulder Creek under FSR #628 would have the most beneficial effect on local fish populations by improving upstream access to about 2 miles of spawning and rearing habitat. A short-term increase in sediment yield would be expected from certain project activities, such as culvert removal and replacements and road maintenance activities, but the long term benefits to the fisheries resource would outweigh the minor impacts. As a result, when considered with other activities occurring in the cumulative effects area, the Boulder Creek Restoration Project is not expected to substantially alter aquatic habitat and fish populations in the watershed.

The following discussion will focus on the potential impacts of a small subset of project components common to both action alternatives. This subset of activities (Table 1) was selected because these project components likely present the greatest potential for risks to the fisheries resource out of the larger list of proposed activities. The remaining activities will not be discussed in detail in this effects analysis because they present a very low risk to the fisheries resource as determined by relevant peer-reviewed research and literature or because the modeling and hydrologic analysis for the BCRP (Hydrology report - project file) determined these activities would not likely pose a measurable change to the aquatic environment (see "Introduction" of this report, pages 1 & 2, for details). For a complete and more detailed description of the proposed activities for both action alternatives, please refer to the EA.

The selected subset of activities (project components) being analyzed for potential impacts to the fisheries resource are identical for the two action alternatives. As a result, direct, indirect, and cumulative effects for both alternatives will be discussed together in the following section.

Fisheries Project Design Features mandatory for both Action Alternatives

Standards and guidelines for aquatic resources from the IPNF Forest Plan, best management practices (Fisheries Project File), and design features would be applied to the project action alternatives to eliminate or reduce potential impacts to riparian areas, aquatic habitat, and westslope cutthroat trout. This effects analysis for the fisheries resource is based on the premise that BMP's and design features would be mandatory and implemented correctly. A complete list of these design features can be found in Appendix B of the EA.

Direct and Indirect Effects

This section discusses the potential effects to the aquatic issue indicators (Table 1) associated with the three different project components determined to be of greatest concern to the fisheries resource. All three components are common to both action alternatives. These include *Commercial Harvest in the Riparian Habitat Conservation Area of Unit 42*, *Culvert Removal and Replacement*, and *Controlling Spread of Invasive Plants*.

Commercial Harvest in Riparian Habitat Conservation Area of Unit 42

Both action alternatives propose a very limited amount of commercial harvest in the RHCA of Boulder Creek to help regenerate these areas into a healthy resilient forest type that would likely improve riparian function in the long term and help achieve our desired condition for this area. Both alternatives would commercially harvest trees in a total of 10 acres in the outer portion (farthest from the stream) of the RHCA in Unit 42 (Figure 2). This unit is adjacent to Boulder Creek and would normally require a 300-foot RHCA buffer that excludes most management activities. However, a minimum of a 150-foot buffer would be maintained.

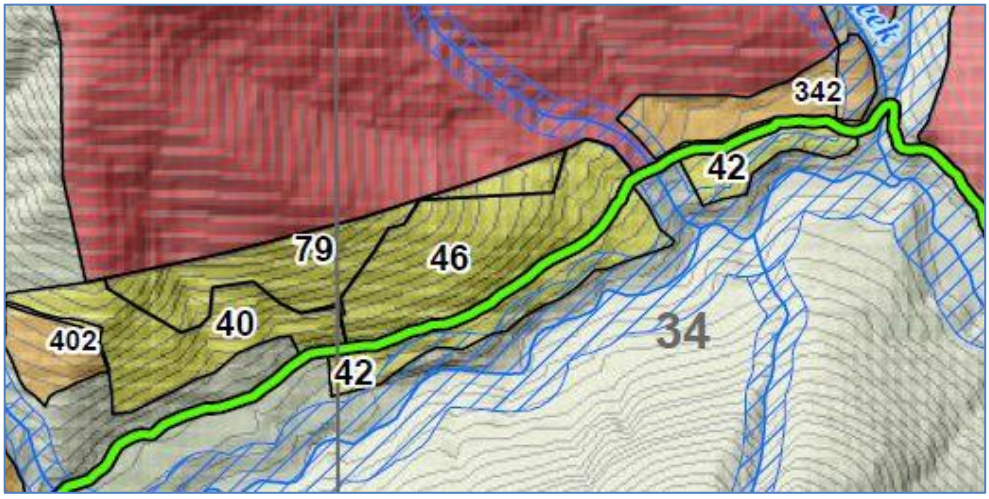

Figure 2. Boulder Creek RHCA buffer relative to Unit 42. Commercial harvest is being proposed where the buffer overlaps with the unit boundary.

The following four *Issue Indicators* have been selected to help analyze for *Commercial Harvest in the RHCA of Unit 42*:

Changes to water temperatures – Solar radiation plays a large role on influencing stream temperatures (Brown 1969; Johnson and Jones 2000; Johnson 2004; Caissie 2006) and maintaining adequate overhead canopy cover along streams is likely the most effective variable to reduce that radiant heat source (Gravelle and Link 2007; Krauskopf et al. 2010). Unit 42 is located on the north side of Boulder Creek and therefore the trees in this unit have very little influence on the amount of shade provided to Boulder Creek. Further, one of the design features developed to minimize or eliminate impacts to aquatic habitat as a result of this activity is that a minimum of 150 feet of undisturbed RHCA would be maintained between the stream and the nearest harvest treatment. In one of the more comprehensive studies on the effects of vegetation manipulation within RHCA's, Anderson et al. (2007) determined that buffers of 49 feet or greater width maintained daily maximum air temperatures, at stream center, of no more than 1°C higher than undisturbed buffers. Further, this 150-foot stream buffer would also leave plenty of mature trees to provide the necessary shade needed to reduce or eliminate solar radiation from reaching Boulder Creek. As a result, this activity under either action alternative would not contribute to raising water temperatures in Boulder Creek.

Changes to instream large wood – As described above, a minimum of a 150-foot undisturbed RHCA buffer would be maintained in this particular unit under both action alternatives. Because

very few trees in this area reach 150 feet in height, only those trees closer to the stream than 150 feet would effectively provide recruitment potential of large wood into the stream channel. In other terms, tree height should dictate the size of the undisturbed riparian corridor, as wood cannot be recruited from a distance that exceeds tree height. As a result of maintaining a 150-foot buffer, large wood recruitment potential is expected to be maintained under either action alternative.

Changes to sediment levels in streams – One of the most important benefits to maintaining appropriate buffer widths is the ability of these buffers to filter out sediments, which may originate from upland management activities, before reaching a stream. In a recent study conducted by Witt et al. (2016), stream buffers of 110 feet were similarly effective at preventing sediment from entering a stream channel as those of the unharvested control watersheds during both base flows and storm flow conditions. Further, in a literature search of the scientific function and effectiveness of stream buffers, Castelle et al. (1994) concluded that buffer widths of a minimum of 49 to 98 feet were necessary to effectively protect wetlands and streams.

In addition to maintaining no less than a 150-foot RHCA buffer in unit 42, mandatory design features would not allow any equipment to be operated on slopes greater than 40%, equipment operated on slopes less than 40% would be required to operate on a slash mat, and all slash generated in the 300-foot RHCA would not be piled and burned and would be left on the forest floor to help with sediment filtration and the soil-building process. As a result, it is unlikely that any sediment generated by management activities in the vicinity of this unit would reach Boulder Creek and affect aquatic habitat or westslope cutthroat trout.

Changes to riparian zone function – For the reasons stated above, reducing the stream buffer width from 300 feet to 150 feet for a small portion of the riparian zone in Unit 42 is unlikely to impede the existing properly functioning condition of the Boulder Creek RHCA.

Culvert Removal and Replacement

As project opportunities under both action alternatives, the culverts passing Middle Fork Boulder Creek under Forest Road #628, Cabin Creek under Forest Road #427, and Black Creek under Forest Road #427 would also be replaced. Each of these culverts are undersized and do not meet minimum streamflow or stream simulation criteria and all exhibit signs of altering the stream channel in the vicinity of the culvert. This could lead to altered spawning and rearing habitats and increased scour and bank erosion both upstream and downstream of the culverts.

The actual type of upgraded crossing structure (i.e. culvert, bottomless arch, bridge) to be used at each location would not be known until the survey and design has been completed. Replacement design objectives would include, at a minimum, the ability to allow the stream to function more properly, the ability to pass 100-year flow events, and the ability to provide upstream passage for all life stages of fish and other aquatic organisms.

Heavy equipment would be used during construction at each location. Instream work would not begin until July 15 and work could be extended into early fall on these streams to minimize disturbances to westslope cutthroat trout. Disturbance would be limited to the existing road prism and road maintenance right of way and Best Management Practices and Design Criteria would be mandatory to minimize or eliminate potential impacts to all resources.

The following two *Issue Indicators* have been selected to help analyze for *Culvert Removal and Replacement*:

Changes to sediment levels in streams - A short-term increase of sediment would likely occur when replacing these three culverts. However, Folz et al. (2007) research of removing culverts suggests that the average sediment delivery of an unmitigated culvert removal (150 pounds) can be reduced to about 3 pounds with the use of appropriate best management practices. Further, the same study documented that sediment levels exceeding criteria known to cause stress to adult fish at unmitigated culvert construction sites had an average duration of only about 5 hours, as measured about 65 feet downstream of the activity. As a result, the long-term benefits of providing greater upstream access to beneficial spawning and rearing habitat for westslope cutthroat trout would far outweigh the potential short-term negative impacts associated with culvert replacement construction.

Changes to habitat connectivity – Currently, all three of these culverts already either block or substantially impede upstream fish passage to beneficial spawning and rearing habitat. Replacing these culverts would have an extremely high likelihood of improving habitat connectivity beyond what currently exists which would allow for unimpeded upstream access to additional habitat for westslope cutthroat trout and other resident fish species. Replacement of these culverts could have short-term (less than 5 days) impacts to habitat connectivity as a section of the stream (<100 feet) would need to be dewatered in the location of the crossing to reduce sediment while construction occurs. However, these impacts would not be long-lasting and the long-term benefits of providing enhanced connectivity to additional habitat would far outweigh any short-term complications.

Control of Invasive/Noxious Plant Species

Noxious weed treatment using herbicides would be mandatory along all haul routes and turn-outs used for vegetation treatments in the Boulder Creek Project area and included as part of both action alternatives. Further, treating weed populations outside of the haul routes would be included as a project opportunity and would occur should funding be available (see BCRP Weeds Report). This opportunity would include areas adjacent to roads, recreation trails, developed and dispersed recreation sites, gravel pits, as well as dense off-road weed infestations or new discoveries of "new invader" species within the BCRP project area.

Weed treatments on the Bonners Ferry Ranger District are typically conducted according to the guidelines, priorities, approved herbicides, methods, and required BMPs established in the Bonners Ferry Noxious Weeds EIS (USDA 1995). However, for the BCRP, we are proposing to use a newer herbicide, aminopyralid, which can be used more effectively and is safer for aquatic environments, but was not covered in the original Weeds EIS. As a result, use of this herbicide needs to be analyzed in the Boulder Creek Restoration Project EA.

Aminopyralid has many advantages over picloran. Picloran is the preferred herbicide identified in the Bonners Ferry Noxious Weeds EIS. Some advantages of aminopyralid include:

- It has very low toxicity to humans
- There is no indication from available data that, when used per label directions, aminopyralid will adversely affect mammals, birds, fish, aquatic and terrestrial invertebrates, terrestrial microorganisms and amphibians (http://www.mass.gov/eea/docs/agr/pesticides/rightofway/docs/aminopyralid-2016.pdf)
- It breaks down in clear surface water in less than 24 hours
- It has less persistence in the environment because of it low use rate

- Treatment can occur up to the water edge (via backpack sprayer, or other non-power equipment), increasing our weed treatment coverage in areas that have never received treatment
- Soil sorption of aminopyralid is greater than that of picloran and that the potential for off-target movement of aminopyralid is less than that of picloran

As a result, we felt it would be worthwhile to move away from the requirements of the 1995 Bonners Ferry Noxious Weeds EIS and transition to an herbicide that is safer to the environment and would allow more effective use. Use of this product for the BCRP would strictly follow use and application guidelines in the safety data sheet and specimen label provided with the product.

The following two *Issue Indicators* have been selected to help analyze for the use of a new herbicide in the *Control of Invasive/Noxious Plant Species*:

Changes to riparian zone function – Because aminopyralid can safely be used up to the water's edge, we would be able to treat invasive/noxious weed species in areas we have never been able to treat in the past. Per direction in the Bonners Ferry Noxious Weeds EIS for using picloran, all treatment needs to stop 150 feet from any surface water. This leaves an invasive weed source to proliferate in riparian areas and eventually spread back into areas already treated (>150 feet from water's edge). By using aminopyralid, most areas with invasive weeds can be treated leaving fewer plants as a source of recruitment. As a result, we would expect the spread of noxious weeds in the RHCA to be reduced and allow native riparian plants to flourish without competition, which should maintain or improve the function of these riparian zones.

Changes to water quality – Based on a comprehensive review of this herbicide by the USDA Forest Service (Durkin 2007), aminopyralid at environmentally relevant concentrations has low potential toxicity to humans, as well as terrestrial animals and aquatic organisms. Though the potential for aminopyralid to contaminate groundwater is high due to its high solubility and prolonged half-life in soil, both EPA and the U.S. Forest Service concluded that predicted short and long-term concentrations of aminopyralid in groundwater are substantially below concentrations of health concern for people using groundwater as a source of drinking water.

In terms of ecological effects, a series of ecological benchmark toxicity concentrations were developed by both EPA and the US Forest Service for various terrestrial and aquatic wildlife. Though there were some differences in some of these values between the two agencies, the evaluations conducted by both agencies point to the same conclusion, that there is no indication from the available data that aminopyralid would adversely affect mammals, birds, fish, aquatic and terrestrial invertebrates, terrestrial microorganisms and amphibians.

Whereas aminopyralid should not be applied directly into water, if applied in a manner that is consistent with the product label, this herbicide should not contribute to significant changes to water quality in the BCRP area.

Cumulative Effects – Alternatives 2 and 3

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

A list of past, present, and reasonably foreseeable actions that could be considered in the cumulative effects analysis have been identified and listed in Table 6 of the Boulder Creek Restoration Project EA. However, not all of these listed actions are relevant to the discussion of

the fisheries resource. Those that have the potential to have considerable effects to aquatic organisms or their habitat, when combined with direct and indirect effects associated with this project, are discussed in greatest detail. For the purpose of this analysis, the actions that are considered most critical are timber harvest, road maintenance and decommissioning or storage, wildfires, and fire suppression. Figure 1 (page 7) of this report illustrates what will be used for the cumulative effects area for the fisheries resource.

Cumulative effects of Past Actions to the aquatic habitat indicators

Past Timber Harvest Activities

In the past, timber harvest practices were not always conducted in ways that protected aquatic habitat and species (fish populations, fish habitat, and riparian areas) as the impacts of these activities on the aquatic resources were not well understood. Many timber operations would harvest trees right down to the stream edge. This has likely occurred in the cumulative effects area in the past and as a result, riparian function, aquatic habitat, and fish populations were likely compromised. However, because the Idaho Forest Practices Act is now in place to restrict such activities in riparian areas and require riparian habitat conservation areas on Federal, State, and private lands, timber harvest no longer has the same level of impacts to aquatic resources that it used to have. These riparian areas are either on the mend or have completely recovered, and when considered cumulatively with the action alternatives, which also primarily exclude operations in RHCAs, detrimental changes in *sediment levels*, *water temperatures*, *instream large wood*, *riparian zone function*, and *habitat connectivity* are not expected.

Past Road Decommissioning, Maintenance, and Reconstruction

Roads are considered one of the greatest threats to aquatic ecosystems because of the potential to transport large quantities of sediment into streams all at once (mass failures) or chronic inputs lasting for years. The Hydrology Specialist Report goes into greater detail about the physical processes and risks associated with roads and therefore will not be repeated here. Roads can also fragment stream habitat by poorly designed and constructed culverts blocking upstream fish passage. However, when roads are removed from the transportation system (decommissioned/stored) or receive maintenance, generated sediment levels tend to be reduced. Under both action alternatives, 76 miles of road maintenance are being proposed, 14.1 miles of road are proposed for storage or decommissioning, and at least one culvert impeding upstream fish migration would be replaced to help restore aquatic habitat connectivity. The BCRP Hydrology report has determined that these actions would help reduce sediment delivered to streams over existing conditions. Therefore, when considered with the action alternatives for the proposed BCRP, impacts associated with past transportation system modifications would likely improve and off-set the existing risks for detrimental changes in *sediment levels* and *habitat connectivity* in streams.

Past Wildfires and Fire Suppression

The last large stand-replacing wildfire in the area occurred in 1910 when approximately 27,000 acres burned. It is unknown what the impacts were to the fisheries resource and whether these effects, if any, are still present.

Of greater concern is the effect past fire suppression has had on the condition of the vegetation in the area. Fire suppression allows forest vegetation to reach climax conditions. This can lead to greater risk for trees dying from insects and diseases in existing stands and can lead to a trend of shorter lived shade-tolerant trees dominating the understory. As a result, an increase of dead and

dying vegetation continues to accumulate and add to fuel loads in the area. Without treatment, the potential for a stand-replacing fire increases with each season of accumulation. If a large high-intensity fire does occur, fish populations and aquatic habitat in the cumulative effects area would likely be negatively impacted. The vegetation treatments and fuels reduction activities associated with the BCRP should help improve stand conditions, reduce fuel accumulations, and ultimately reduce the chance for large wildfires and the associated impacts they can have on the fisheries resource.

Cumulative effects of Current and Future Actions to the aquatic habitat indicators

Present and Foreseeable Timber Harvest Activities

Timber harvest on National Forest System managed lands in the cumulative effects area is occurring and expected to occur over the next 10 years, and beyond. As previously mentioned in the "Past Actions" discussion, the Idaho Forest Practices Acts would require the use of riparian buffers and other best management practices during timber harvest and vegetation management projects. Therefore, when considered with ongoing and future timber harvest, the BCRP should not cumulatively contribute to detrimental changes of *sediment levels*, *water temperatures*, *instream large wood*, *riparian zone function*, and *habitat connectivity* in area streams.

Present and Foreseeable Road Decommissioning and Maintenance

Road Maintenance and decommissioning in the cumulative effects area are presently scheduled and expected to continue in the future. As mentioned previously, both of these activities will likely be beneficial to the fisheries resource. When considered cumulatively with the proposed road storage, maintenance, and culvert replacements for BCRP, benefits to the aquatic resources are expected to increase by improving on existing *sediment levels* and *habitat connectivity* in project area streams.

Present and Foreseeable Wildfires and Fire Suppression

Obviously, it would be hard to predict when a large wildfire might occur in the cumulative effects area. However, because fire suppression will likely continue in the future, the potential impacts to the fisheries resource as a result of a high intensity fire will remain a very realistic threat. By engaging in fuels reduction activities and vegetation manipulation efforts associated with this project, the chances of a high intensity fire in the future could be reduced and associated potential impacts to aquatic habitat and westslope cutthroat trout populations may also be lessened.

Determination of Effects on Aquatic Habitat from Alternatives 2 and 3

The direct, indirect, and cumulative effects of alternatives 2 or 3 would not be expected to have substantial or measurable impacts to the existing condition of aquatic habitat in the Boulder Creek Restoration Project area or the cumulative effects area. The replacement of the culvert passing Middle Fork Boulder Creek under FSR #628 would certainly reduce habitat fragmentation and improve upstream access to beneficial spawning and rearing habitat. When applied appropriately, the use of aminopyralid would enable more effective control of noxious weeds and allow treatment well into the RHCA's. This, in turn, should reduce competition to native riparian plant species and allow these areas to continue to function properly. The associated road maintenance and storage in both alternatives would provide some relief to chronic sedimentation into streams and reduce the chances for larger road fill failures. Reducing sedimentation into Boulder Creek and its tributaries would allow these streams to continue to effectively process and cycle sediment through the system and help maintain existing aquatic habitat conditions.

Determination of Effects on Westslope Cutthroat Trout from Alternatives 2 and 3

The direct, indirect, and cumulative effects of alternatives 2 or 3 would likely not have a measurable negative impact on the resident population of westslope cutthroat trout in the Boulder Creek Restoration Project area or the cumulative effects area. The replacement of the culvert passing Middle Fork Boulder Creek under FSR #628 would have the most beneficial effect to the local population. An initial increase in sedimentation into the stream may occur as a result of the culvert replacement, and some of the road maintenance, but effects would be very short term and limited to a few individual fish. Published research on culvert removals suggests that sediment levels exceeding criteria known to cause stress to adult fish at unmitigated culvert construction sites had an average duration of only about 5 hours, as measured about 65 feet downstream of the activity (Folz et al. 2007). Because Forest Service construction contracts require numerous BMP's and design criteria, we would expect the stress period to be far less than 5 hours. As a result, these activities would not likely lead to a trend that would warrant federal listing for westslope cutthroat trout.

Compliance with Forest Plan and Other Relevant Laws, Regulations, and Policies

Idaho Panhandle National Forests Revised Forest Plan (2015)

All alternatives meet the goals, desired conditions, objectives, standards, and guidelines of the Idaho Panhandle National Forests Revised Forest Plan for aquatic habitat and aquatic species (Boulder Creek Restoration Project File).

Endangered Species Act

All alternatives meet requirements of the Endangered Species Act. An effects determination for bull trout and designated critical habitat will be provided separately in a Biological Assessment. Further, project activities have been designed to reduce impacts and improve conditions for sensitive species, such as westslope cutthroat trout, which could benefit existing local populations and help prevent future ESA listing.

National Forests Management Act

Best Management Practices for soil and water conservation and Inland Native Fish Strategy guidelines and standards would be applied under all action alternatives insuring that project activities would be carried out in a manner so as to protect soil, watershed, and fish resources.

Idaho Forest Practices Act

Best Management Practices needed to meet or exceed guidelines described in the Soil and Water Conservation Handbook would be applied under all action alternatives. These practices would help achieve the water quality element of the Idaho Forest Practice Act. A recent audit of BMPs pertaining to water quality indicates the USFS averaged 99 percent compliance with BMP rules since 1996 (IDEQ 2009, 2012).

Executive Order 12962 Recreational Fisheries

Alternatives 2 and 3 are consistent with Executive Order 12962 regarding aquatic systems and recreational fisheries. Short-term impacts may affect westslope cutthroat trout, rainbow trout, and brook trout individuals but would not lead toward a trend in federal listing that would prohibit harvest of these species. Long-term effects such as reduced habitat fragmentation achieved by replacing barrier culverts and net reduction in sediment as a result of road

maintenance are expected to benefit westslope cutthroat trout survival and habitat and therefore maintain or improve recreational angling opportunities.

Executive Order 13112 – Invasive species

The Forest Service and this project are compliant with this order as new invasive species are not expected to be introduced as a result of implementation of any of these project alternatives.

Idaho Stream Channel Protection Act

The only stream channel alteration being proposed by alternatives of this project consists of removing a culvert that prevents upstream fish migration. This is considered a beneficial alteration as the activity would allow the stream to function naturally and allow fish access to beneficial upstream habitat.

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